## (19) World Intellectual Property Organization

International Bureau



## 

(43) International Publication Date 15 September 2005 (15.09.2005)

PCT

(10) International Publication Number WO 2005/086391 A1

(51) International Patent Classification7:

H04B 10/18

(21) International Application Number:

PCT/EP2005/051061

(22) International Filing Date:

9 March 2005 (09.03.2005)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: MI2004A 000446

9 March 2004 (09.03.2004) IT

- (71) Applicant (for all designated States except US): MAR-CONI COMMUNICATIONS SPA [IT/IT]; Via Lodovico Calda 5, I-16153 Genova (IT).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): SECONDINI, Marco [IT/IT]; Viale Del Tintoretto 88, I-00142 Roma (IT). FORESTIERI, Enrico [IT/IT]; Via Belgrado, 9, I-43100 Parma (IT). PRATI, Giancarlo [IT/IT]; Via Molossi 23, I-43100 Parma (IT). COLAVOLPE, Giulio [TT/IT]; Via Ognibene 15, I-43100 Parma (IT).
- (74) Agents: COLLIER, IAN et al.; Marconi Intellectual Property, Crompton Close, Basildon Essex SS14 3BA (GB).

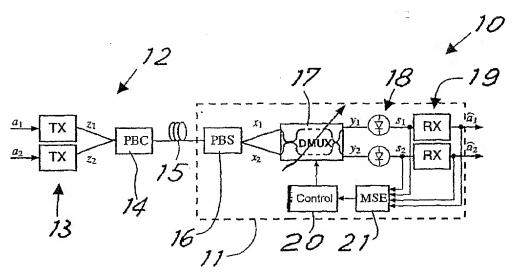
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

## Published:

with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SYSTEM, METHOD AND APPARATUS FOR POLARIZATION MODE DISPERSION COMPENSATION AND DE-MULTIPLEXING POLARIZATION MULTIPLEXED SIGNALS



(57) Abstract: A polarization multiplex transmission system (10) comprises two optical signals (z<sub>1</sub>, z<sub>2</sub>) transmitted over the same optical fibre (15) at the same wavelength but with orthogonal polarizations. The system is characterised by receiving apparatus (10) which is operable to filter the two components with orthogonal polarization of the signal received in accordance with an appropriate transfer matrix which is dynamically controlled on the basis of the output signals in such a manner as to approximate the reverse transfer matrix of the fibre in the region of the spectrum occupied by the signal so as to compensate for Polarization Mode Dispersion (PMD) and polarization rotation introduced by the fibre and eliminating distortion and mutual interference effects for both the signals and thereby obtain a demultiplexed output corresponding to the two transmitted signals.

